DATA PROCESSING CARD SYSTEM AND METHOD OF FORMING SAME

BACKGROUND OF THE INVENTION

1. Field of the Invention

This invention pertains to data processing systems. In particular, this invention directs itself to a data processing system packaged within the confines of the geometrical dimensions of a card-like member. More in particular, this invention relates to a data processing system which includes a plurality of circuit chip devices mounted on at least one flexible carrier member. Still further, this invention pertains to a data processing system having a plurality of interconnected circuit chip devices which are electrically mounted to a flexible carrier member wherein the flexible carrier member is structurally and electrically coupled to a substrate carrier having at least one electrical pattern formed on at least one surface thereof. Still further, this invention relates to a data processing system wherein a plurality of inter-connected circuit chip devices are mounted on a flexible carrier interfaced therewith, and are electrically coupled to a rigid substrate carrier member having an electrical pattern formed thereon with predetermined electrical coupling between the circuit chip devices and the electrical pattern formed on the substrate carrier member. Additionally, this invention directs itself to a data processing system which includes a substrate carrier member coupled to a flexible carrier containing circuit chip devices which in combination are sandwiched between opposing substantially hermetically sealed layers. Further, this invention pertains to a data processing system which utilizes a rigid substrate carrier member for dissipation of heat and as an electrical interconnector between circuit chip devices mounted on the flexible film carrier member.

2. Prior Art

Data processing systems formed in the geometrical contour of a card-like member are known in the art. Prior art systems known to applicant include U.S. Pat. Nos.:

4,295,041	4,211,919	4,352,011
4,222,516	4,004,133	3,702,464
4,064,522	3,876,865	4,105,156
4,102,493	3,906,460	4,092,524
4,001,550	4,007,355	4,256,955
4,204,113	3,845,277	3,971,916
3,637,994	3,559,175	4,361,756
4,298,793	3,641,499	3,142,823
3,970,824	3,438,489	3,831,119
3,851,153	3,881,175	4,115,662
4,058,830	3,934,122	3,868,057
3,873,019	3,852,571	3,378,920
3,894,756	3,134,254	3,185,964
3,377,616	3,772,659	3,832,530
3,849,633	4,022,370	3,919,447

In some prior art data processing systems, such as that shown in U.S. Pat. No. 4,295,041, there is provided a portable data carrier including a microprocessor. However, in such prior art systems, there are provided read only memory circuitry and such does not direct itself to electrically alterable program read only memory systems. Additionally, such prior art systems are not able to enclose standard type credit card housing sufficient circuitry to provide for an overall data processing system, as is provided by the subject invention concept.

In other prior art systems such as that shown in U.S. Pat. No. 4,211,919, there is provided a portable data carrier which also includes microprocessing systems. However, in such prior art systems, dense packaging of logic circuitry cannot be accomplished within the card-like housing geometrical constraints. Such prior art systems do not provide for a substrate carrier layer which is integrated into the electrical logic system, as is provided in the subject invention concept.

In other data processing systems, chip circuit devices are mounted and coupled to relatively thick carrier surfaces. Such carrier members do not allow for a plurality of circuit chips to be mounted in a manner to provide an overall relatively thin card-like data processing system.

In other prior art data processing card-like systems, a substrate carrier is provided which generally directs itself to dissipation of heat generated during operational use. However, such prior art systems do not provide for circuit patterns to be formed thereon and thus become a part of the logic circuitry of the overall data processing system.

Other prior art data processing systems are limited in the number of circuit chips mounted therein due to the fact that coupling of chip contact regions is limited by the physical dimensions of the system. Such prior art systems do not provide for a flexible carrier mounted below and in adjacent contiguous contact with circuit chips to maximize the number of electrical connections attainable as in the instant invention concept.

In still other prior art systems, the circuit chips forming the data processing system are mounted on relatively thick carriers which disadvantageously increases the overall thickness dimension of such prior art systems.

SUMMARY OF THE INVENTION

A data processing card system which includes a mechanism for mounting at least one circuit chip device thereon. A substrate carrier mechanism is located adjacent the circuit chip device mounting mechanism. The substrate carrier mechanism has at least a first predetermined electrical lead pattern formed thereon and the electrical pattern is electrically coupled to predetermined contact areas of the circuit chip device. There is also provided a mechanism for substantially isolating the combined substrate carrier mechanism and the circuit chip device mounting mechanism from an external environment.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a perspective view of the data processing card system;

FIG. 2 is a perspective, exploded and partially cutaway view of the data processing card system showing the substrate carrier member and the flexible carrier member sandwiched between opposing isolating plastic layer members;

FIG. 3 is a sectional view of the data processing card system taken along the section line 3—3 of FIG. 1;

FIG. 4 is a perspective, and exploded view of an embodiment of the data processing card system showing a substrate carrier member sandwiched between first and second flexible carrier members each having a plurality of circuit chip devices mounted thereon for